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ABSTRACT

The purpose of this study is to determine the effectiveness of audiovisual aids in the instruction of junior-level preservice teachers. The tapes used were vignettes of persons demonstrating specific teaching skills in the areas of lesson organization, questioning, using student ideas, praise and corrective feedback, and variety and variation in teaching styles. Ninety-six subjects were assigned to one of four groups. All groups were pretested and posttested with identical measures. For each of the five topics, the treatment groups were: tapes only; tapes plus instruction; instruction only; and control. It was hypothesized that preservice teachers who receive instruction and view protocol tapes will score significantly higher on related posttests than teachers who only receive instruction or who only view tapes. An unexpected consequence of this study was the finding that the control group, which received neither verbal nor visual instruction related to the topics of the tapes, performed just as well on related posttests as groups that did receive such instruction. The results of this study support the contention that no generalizations can be made concerning the effectiveness of media in instruction and that each type of media must be evaluated individually. (JD)

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THE EFFECTIVENESS OF PROTOCOL TAPES WITH PRESERVICE TEACHERS

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Berliner and others cite a variety of studies which conclude that students learn better when taught by a variety of methods; one can still question, however, the effectiveness of any one method of audiovisual instruction (3). A specific question is whether the use of particular audiovisual aids designed to impart skills, such as protocol tapes, actually do in fact enhance students' learning of these skills. The purpose of this study was to determine the effectiveness of protocol tapes, both in isolation and in conjuction with direct instruction, with respect to acquisition and application of knowledge of basic teaching skills by preservice teachers. Protocol tapes are vignettes of persons demonstrating specific skills in natural settings. Teacher education protocol tapes typically illustrate behaviors exemplifying skills in areas such as reinforcement, questioning, feedback, and lesson organization, to name a few.

In the Fall of 1972, Florida International University (FIU) was selected by the Florida Department of Education (FDOE) to be a fieldtest site for protocol tapes produced by the Far West Regional Laboratory (FWRL). As FIU was a new institution, the protocols did not need to be "added" to an existing program but rather were integrated into the instructional sequence. An extensive survey of FIU students, conducted by the FDOE from September, 1972 through June, 1974, indicated that affectively the tapes were a success (7). Students expressed very favorable attitudes towards the tapes and their effectiveness in teaching skills. Cognitive impact, however, still remained to be demonstrated. Did students actually gain replicable knowledge as a result of

viewing tapes they reportedly enjoyed?

Past research, both directly and indirectly related to the protocol tapes, suggested that they ought to be effective. The FWRL tapes are accompanied by reviews of literature which appear to validate the concepts they illustrate. Literature also supports an implied assumption of the tapes, namely that skills can be acquired in clusters and need not be learned as discreet entities (1, 2).

There is also evidence to support the contention that students learn through imitation. (2,4,9). With respect to teacher training specifically, the literature is not clear. With respect to the effectiveness of modeling, MacDonald, for example, has reported on a series of studies, using both symbolic (written) and nonsymbolic (perceptual)models, in which no significant effects were found (8). MacDonald, however, believes that the lack of significance may be attributable to a number of extraneous factors such as overly-complex experimental designs. Further, there is some evidence to indicate that nonsymbolic modeling is more effective than symbolic modeling (5, 6).

In addition to the research, the bulk of which supports the effectiveness of nonsymbolic, or perceptual, modeling, fieldtest data reported by FWRL support the effectiveness of the FWRL protocol tapes, especially when they are used in conjunction with live instruction. Therefore, it was hypothesized that junior-level preservice teachers who both receive instruction and view protocol tapes will score significantly higher on related posttests than junior-level preservice teachers who only receive in-

struction or who only view tapes. This hypothesis was put forth for each of five tape topics: Lesson Organization, Questioning, Using Student Ideas, Praise and Corrective Feedback, and Variety and Variation.

Method

Subjects

Subjects were 96 junior-year students enrolled at FIU in a single general methods course. Students enrolled in the general methods course had previously had only two education courses, a history of education course and an educational psychology course, both at the community college level. Although the students were able to articulate their interest in some specific area of education, they had not, as yet, been admitted to any program sequence not had they declared a major course of study. No student enrolled had had any general or specific methods course.

Materials

Experimental materials were five FWRL protocol tapes, each composed of edited sequences of teachers in realistic classroom settings at the upper elementary and secondary levels (3). The content of the tapes was as follows:

1. Lesson Organization - This tape illustrates nine subcategories of skills related to the presentation and organizational flow of a lesson: specification of objectives, review, task orientation, signals of transition, emphasis, clarity of explanation, checks for comprehension, personal organization of the teacher, and summary.

2. Questioning - Through a videotaped teacher-led discussion in a fifth-grade reading group, two major skills are demonstrated, use of lower-and higher-order questioning and questioning techniques. Effects of discussion on participating students are also shown.

3. Using Student Ideas - Again using the setting of a fifth grade classroom, this tape shows a teacher leading a lesson designed to elicit student responses in what might be termed an inquiry or discovery method. The teacher presents a opical situation, elicits and records student responses and classifies these responses into major categories for later study. The teacher demonstrates two reinforcing skills, acknowledgement and use of student responses.

4. Praise and Corrective Feedback - This tape illustrates verbal and nonverbal praise for correct academic and social responses as well as four methods of corrective feedback: cueing and prompting, giving of directions, redirecting responses and probing. A primary grade mathematics group was realistically videotaped for this demonstration.

5. Variety and Variation - A variety of behavior patterns for the teacher (personal style, teacher methods, generation of teaching alternatives), as well as variety within the classroom environment (individualized activities, multimedia materials, varied seating configurations, richness of physical set up) are shown in an upper elementary classroom.

The pretests and posttests used in the experiment were in all cases possible those generated by FWRL for their fieldtesting of

the protocol tapes. In the single case where a posttest was not provided in materials from FWRL, a line-by-line analysis of pretest content was made and a paraphrased parallel test was generated. Not all of each FWRL pretest was given to students in the experimental pretest; this would have generated an overly long and cumbersome test instrument since FWRL developed a complete test for each tape. Instead, sample test items were chosen from each of the five FWRL pretests to form a representative question sampling and to parallel as closely as possible FWRL pretests.

Design and Procedure

As in several of the FWRL fieldtest studies, the randomized pretest-posttest control group design was applied in the present study. The 96 students enrolled in the general methods course were randomly assigned to one of four treatment groups. At the first meeting of the class all students were given the pretest covering concepts contained in the protocol tapes. Subsequently students were informed that they would meet in four separate seminar sections in addition to their large group meetings. This class scheduling design paralleled standard class schedules, the difference with this large section being that students were randomly assigned to seminar groups rather than self-selecting a time for seminar. Treatment groups were as follows:

Group 1, the tape-only (TO) group, viewed the tape and was immediately given a posttest. The tests were collected immediately and lecture and discussion followed. The instructor-led classroom activities typically followed the conceptual framework of the tape.

Group 2, the tape plus instruction (TI) group viewed the tape and lecture and discussion followed. It is important to note that great care was taken in the groups participating in lecture and discussion involving protocol tapes that these activities were as parallel as possible; lesson planning was as precise as possible in that lectures were rigidly outlined, pivotal questions for discussion were prespecified, and amplifying examples were identical. At the end of the class period, students received a posttest.

Group 3, the instruction-only (IO) group, did not view any tapes. They listened to lecture and participated in discussion, preplanned as outlined above. As an additional activity, the concepts presented in a particular protocol tape were presented by the lecture method with verbal examples similar to those viewed by the TO and TI groups. At the end of class, students were given a posttest.

Group 4, the control (C) group, received instruction and participated in discussion on any course topic except those covered by the protocol tapes. The group came to perceive the seminar as a review session for other class experiences: microteaching laboratories, questions, problem solving and the like. During the experiment care was taken to avoid protocol tape topics; student questions related to tape topics were parried so as not to introduce this material to the group. At the end of the class session, students received a posttest.

It should be noted that because the TO and TI groups met on different days than did the IO and C groups, videotape equipment was always present for the former two groups and never present for

the latter two groups. Also, since many videotapes are used within the course structure routinely, the viewing or not viewing of videotapes was not a unique experience.

Results

A major premise of this study was that no generalizations can be made concerning the effectiveness of media in instruction, each type of media and each instance of each type must be evaluated separately. Thus, as was the case in the FWRL fieldtesting, each protocol tape was considered a separate entity. Due to the resulting number of simple analyses of variance which were performed (six), the .01 level was selected for determining the significance of differences.

Although 96 students were originally assigned to 4 groups of 24 each, unequal group sizes resulted from two major factors. First, a number of students dropped the course before the first class meeting. Second, a number of students who remained in the course missed the first class meeting and consequently the pretest. Such students were excluded from all data analyses. The resulting numbers of students in each group were 22, 16, 16, and 22 respectively for the TO, TI, IO, and C groups. Pretest means and standard deviations were as follows: 76.40-5.61 (TO), 75.31-6.30 (TI), 74.38-5.38 (IO), and 76.36-5.64 (C). Results of a simple analysis of variance indicated no significant difference among the groups on the pretest ($F = .99$, $df = 3,72$).

Visual inspection of the means suggested no significant differences among the groups for any of the five topics (see Table 1). A series of simple analyses of variance confirmed the lack

TABLE 1. - Means, Standard Deviations, and F's by Group, for each Topic.

Topic		Group				F
		TO	TI	IO	C	
Organization						
	$\bar{X}$	7.11[a]	7.62	7.00	7.25	
	SD	1.29	1.59	1.59	1.18	.49*
	N	19	13	15	20	
Questioning						
	$\bar{X}$	4.00	4.13	4.58	4.48	
	SD	.86	1.15	.76	.85	1.39*
	N	19	15	12	21	
Using Ideas						
	$\bar{X}$	16.24	15.92	15.67	16.24	
	SD	2.10	2.75	2.21	1.73	.20*
	N	17	12	12	17	
Feedback						
	$\bar{X}$	146.47	146.63	147.75	144.82	
	SD	13.30	13.34	14.24	11.47	.12*
	N	17	8	12	17	
Variety						
	$\bar{X}$	66.53	68.93	70.15	66.61	
	SD	8.28	4.04	6.29	3.71	2.46*
	N	15	14	13	18	

* NS

[a] Maximum scores for the five posttests were 11, 5, 22, 172, and 95, respectively.

of significant differences (see Table 1). Thus the original hypotheses were not supported in any instance.

Discussion

The results of the present study concerning the effectiveness of the tapes are not in agreement with the fieldtest findings reported by the Far West Regional Laboratory. One obvious explanation is the fact that distinctly different subject populations were involved in the present study and the FWRL fieldtesting, junior-level preservice teachers as opposed to interns, paraprofessional teaching aids, and educational psychology students. Thus the lack of generalizability of media effectiveness mentioned previously may apply also to consumer populations.

However, there was one aspect of the findings which required further investigation. An unexpected consequence of the lack of significant differences was the finding that the control group, which received neither verbal nor visual instruction related to the topics of the tapes, performed just as well on related posttests as groups which did receive such instruction. Two possible explanations were proposed. First, between - group contamination may have occurred in that members of the control group may have learned the concepts included in the posttests, through discussion with members of the other groups, for example. A second explanation, suggested by the relatively high pretest performance of all groups (approximately 75%), was that any similar group of subjects would score equally well on the posttests, without any instruction at all. In other words, it was conceivable that due to factors such as the general, common-sense - knowledge nature of the concepts, or the

invalidity of the posttests, any similar preservice group of subjects would score similarly, regardless of instruction, or lack of it.

In order to assess the validity of the second explanation, the five posttests were administered to a new group of students, enrolled in the same course but in a subsequent quarter, prior to any related instruction. Posttests of students enrolled in the course for other than a first time were excluded from analysis resulting in a group of 25 students. Students were told that the tests represented preassessment. On two of the five posttests, the "novice" group performed equally well as the control group in the original study ($\bar{X}$ = 145.56 versus 144.82 on Praise and Corrective Feedback, and 66.68 versus 66.61 on Variety and Variation). On three of the posttests, however, numerical differences in the means required statistical analysis in order to determine significant difference or lack of it. Three t tests for independent samples were performed (p = .01). In each case the mean posttest score of the novice group was compared to the mean posttest score of the group in the original study which had scored highest. In the case of Using Student Ideas, the novice group mean of 15.12 was found to be not significantly different from the mean of 16.24, the mean of the highest scoring original group (t = 1.62, df = 40). For both Lesson Organization and Questioning, however, significant differences were found. For Lesson Organization, the novice posttest mean score of 6.08 was significantly lower than the highest original posttest mean score of 7.62 (t = 2.75, df = 36, $p < .01$). For Questioning, the novice posttest mean score of 2.12 was

significantly lower than the highest original posttest mean score of 4.58 ($t = 5.86$, $df = 35$, $p < .01$).

Thus, for at least three of the topics, for whatever reason, it would seem to be not possible to evaluate the effectiveness of the FWRL protocol tapes with preservice subjects in that all will perform equally well regardless of the absence or presence or type of instruction. The significant differences which were found were both for posttests containing small numbers of items, 11 and 5 for Lesson Organization and Questioning, respectively. Therefore, it may be lack of validity and reliability of the measures which resulted in the significant differences rather than true differences in knowledge. Although between - group contamination is still a possible explanation for the high performance of the control group in the original study, the high performance of the novice group on three of the posttests, coupled with the suspect validity and reliability of the other two posttests, make this explanation unlikely.[1]

As in any research study, the validity of the results is a function of the validity of dependent measures. It is recommended that before any further research is conducted concerning the effectiveness of the FWRL protocol tapes, a comprehensive validation study of posttest measures be undertaken. As for the present study, it can only be concluded that effectiveness of any tape with respect to acquisition of knowledge was not demonstrated.

The results of this study support the contention that no generalizations can be made concerning the effectiveness of media in instruction, that each type of media must be evaluated individually. Despite the literature supporting modeling as an effective

learning strategy and student data expressing positive feelings toward the protocols, the protocol tapes were found to not have a significant effect on posttest achievement.

FOOTNOTES

1. FWRL fieldtest reports do not include statistical analysis of achievement scores for either the Lesson Organization tape or the Questioning tape.

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